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AVAGO TECHNOLOGIES, LTD.
P.O. BOX 1920
DENVER, CO 80201-1920

EXAMINER	
WALFORD, NATALIE K	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/803,266
Filing Date: March 18, 2004
Appellant(s): NG, KEE YEAN

Avago Technologies, LTD.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 16, 2007 appealing from the Office action mailed August 14, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2002/0043926	Takahashi et al.	4-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al. (US PUB 2002/0043926).

Regarding claim 1, Takahashi discloses a device (FIG. 1, item 1) for emitting composite output light, the device including a light source (FIG. 1, item 10) that emits original light, the light source including a fluorescent layer (FIG. 6A, item 37) having a property to convert some of the original light into first converted light (page 4, paragraph 62); and a wavelength-conversion region (FIG. 1, item 35) optically coupled to the light source to receive some of the original light and the first converted light (page 6, paragraph 94), the wavelength-conversion region including a fluorescent material (FIG. 1, item 36) having a property to convert some of the original light into second converted light, the original light (page 6, paragraph 94), the first light and the second converted light being components of the composite output light.

Regarding claim 2, Takahashi discloses the device of claim 1 wherein the light source is a light emitting diode die and wherein the fluorescent layer is a substrate of the light emitting diode die (FIG. 6A).

Regarding claim 3, Takahashi discloses the device of claim 1 wherein the fluorescent material of the wavelength-conversion region includes at least one of fluorescent organic dye, inorganic phosphor and nano-phosphor (page 5, paragraph 82).

Regarding claim 4, Takahashi discloses the device of claim 1 wherein the fluorescent material of the wavelength-conversion region includes fluorescent particulates (FIG. 1, item 36) to scatter the original light and the first converted light that propagate through the wavelength-conversion region.

Regarding claim 5, Takahashi discloses the device of claim 1 wherein the wavelength-conversion region is configured to substantially enclose the light source over a surface on which the light source is positioned (FIG. 1).

Regarding claim 6, Takahashi discloses the device of claim 5 wherein the wavelength-conversion region is positioned on the light source such that the light source is covered by the wavelength-conversion region (FIG. 1).

Regarding claim 7, Takahashi discloses the device of claim 1 wherein the wavelength-conversion region is configured as a planar layer positioned over the light source (FIG. 1).

Regarding claim 8, Takahashi discloses a method for emitting composite output light, the method including: generating original light within a light source (FIG. 1, item 10); converting some of the original light into first converted light within the light source (page 4, paragraph 62); converting some of the original light into second converted light outside of the light source (page 6, paragraph 94); and emitting the original light, the first converted light and the second converted light as components of the composite output light (page 6, paragraph 94).

Regarding claim 9, Takahashi discloses the method of claim 8 wherein the generating of the original light includes generating the original light within an active layer of a light emitting diode die (page 1, paragraph 15).

Regarding claim 10, Takahashi discloses the method of claim 9 wherein the converting of the original light into the first converted light includes converting the original light into the first converted light at a fluorescent substrate of the light emitting diode die (page 1, paragraph 14).

Regarding claim 11, Takahashi discloses the method of claim 8 wherein the converting of the original light into the second converted light includes converting the original light into the second converted light (page 6, paragraph 94) at a wavelength-conversion region optically coupled to the light source (FIG. 1, items 35 and 10).

Regarding claim 12, Takahashi discloses the method of claim 11 wherein the converting of the original light into the second converted light includes converting the original light into the second converted light using fluorescence (page 3, paragraph 56).

Regarding claim 13, Takahashi discloses the method of claim 12 wherein the converting of the original light into the second converted light includes scattering the original light and the first converted light propagating through the wavelength-conversion region (page 6, paragraph 94).

Regarding claim 14, Takahashi discloses a device (FIG. 1, item 1) for emitting composite output light, the device including: a semiconductor die (FIG. 1, item 10) that emits first light of a first peak wavelength, the semiconductor die including a fluorescent substrate (FIG. 6A, item 37) having a property to convert some of the first light into second light of a second peak wavelength (page 4, paragraph 62); and a wavelength-conversion region (FIG. 1, item 35) positioned to

receive at least some of the first light and the second light, the wavelength-conversion region having a property to convert some of the first light into third light of a third peak wavelength (page 6, paragraph 94), the first light the second light and the third light being components of the composite output light (page 6, paragraph 94).

Regarding claim 15, Takahashi discloses the device of claim 14 wherein the semiconductor die is a light emitting diode die (page 2, paragraph 48 thru page 3, paragraph 50).

Regarding claim 16, Takahashi discloses the device of claim 14 wherein the wavelength-conversion region includes at least one of fluorescent organic dye, inorganic phosphor and nano-phosphor (page 5, paragraph 82).

Regarding claim 17, Takahashi discloses the device of claim 14 wherein the wavelength-conversion region includes fluorescent particulates (FIG. 1, item 36) to scatter the first light and the second light that propagate through the wavelength-conversion region.

Regarding claim 18, Takahashi discloses the device of claim 14 wherein the wavelength-conversion region is configured to substantially enclose the semiconductor die over a surface on which the semiconductor die is positioned (FIG. 1).

Regarding claim 19, Takahashi discloses the device of claim 18 wherein the wavelength-conversion region is positioned on the semiconductor die such that the semiconductor die is covered by the wavelength-conversion region (FIG. 1).

Regarding claim 20, Takahashi discloses the device of claim 14 wherein the wavelength-conversion region is configured as a planar layer positioned over the semiconductor die (FIG. 1).

(10) Response to Argument

Applicant's arguments beginning at page 4, in regards to the rejection of claims 1-20 under 35 U.S.C. 102(b) as being anticipated by Takahashi et al. (US PUB 2002/0043926) have been considered, but are not persuasive. Applicant contends that Takahashi does not disclose both "a light source...including a fluorescent layer" and "a wavelength-conversion region optically coupled to said light source".

The Examiner first points to paragraph 97, which states that a fluorescent layer (item 37) is provided with the light source (item 10) so that the fluorescent resin (item 35) (i.e. wavelength-conversion region) can be omitted. Since the fluorescent resin CAN BE OMITTED, there is no evidence that precludes both the fluorescent layer and resin to be present. Secondly, the Examiner points to pages 12 and 13 of Takahashi, in which claim 13 discloses that a fluorescent layer made from light-transmissible material is provided on a side surface of the light emitting device. Claim 13 depends on claim 3, which discloses a fluorescent material is constituted by a powdery or granular material and is contained in a light-transmissible material. Claim 3 depends on claim 1, which discloses a light-emitting unit comprising a light-emitting device, a fluorescent material, and a part of light emitted from said light-emitting device is emitted outward after it is subjected to wavelength-conversion by said fluorescent material.

Hence, the reference clearly contemplates that multiple embodiments are present, specifically including the fluorescent layer and fluorescent resin present in the same embodiment (i.e. NOT omitted). Therefore, Takahashi clearly anticipates the instant application with a fluorescent layer (item 37) and a wavelength-conversion region (item 35) present.

Furthermore, Applicant has also contended that Takahashi does not disclose that "converting some of said original light into first converted light within said light source" and "converting some of said original light into second converted light outside of said light source".

The Examiner points to paragraph 62, which clearly states that the fluorescent material (which is present in both the layer and resin) emit light using light emitted from the light-emitting device. That is, part of the light emitted from the light-emitting device is subjected to wavelength-conversion by the fluorescent material. As a result, light with a wavelength (first converted light) different from the light emitted from the light-emitting device is generated. The light subjected to wavelength conversion (first converted light) is mixed with the other part of light not subjected to wavelength conversion, such that the mixed light (second converted light) is emitted finally. Since the fluorescent layer is a part of the light-emitting device, the first converted light would occur within the light source.

Hence, the reference clearly is "converting some of said original light into first converted light within said light source" and "converting some of said original light into second converted light outside of said light source".

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Natalie K. Walford

Patent Examiner

Conferees:

Ricky Mack

Supervisory Patent Examiner

Nimesh Patel

Supervisory Patent Examiner

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Natalie K. Walford 5/10/07

Patent Examiner

Sikha Roy
SIKHA ROY
PRIMARY PATENT EXAMINER

Conferees:

Ricky Mack

Supervisory Patent Examiner

Nimesh Patel

Supervisory Patent Examiner